

The Examiner has rejected Claims 6 and 8 under 35 U.S.C. §112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention.

Applicant respectfully submits that claims 6 and 8 have been amended herewith to more clearly point out the subject matter regarded as the invention. Specifically, claim 6 no longer recites "wherein after step b), said method further includes a step b1) of...", and claim 8 no longer positively recites a "base plate". Accordingly, Applicant respectfully requests that the rejections of claims 6 and 8 under 35 U.S.C. §112, second paragraph, be withdrawn.

The Examiner has rejected Claims 1-3 and 5-15 under 35 U.S.C. §102(b) as allegedly anticipated by Weber et al. (U.S. Patent No. 526,512).

Applicant respectfully submits that claims 1-3 and 5-15 have been amended herewith to more accurately describe the novel aspects of the present invention. The amended claims are drawn to a novel **thin** base that not only possesses water-absorbing ability and a humidity-maintaining ability, but also a **natural decomposing ability** as well. Support for these claim amendments can be found in the specification on page 2, lines 13-17, and on page 3, lines 12-14, which describe the use of a thin base that possesses a natural decomposing ability.

The Examiner asserts that Weber et al. disclose a method of sowing seeds comprising providing a base with a plurality of concavities which has water-absorbing ability and humidity-maintaining ability, inlaying seeds in the concavities of the base, and covering a cultivating material with the base such that each concavity has a void therein for

allowing a radicle of a corresponding seed to pierce therethrough and be rooted in the cultivating material.

A rejection under 35 U.S.C. §102(b) is warranted only when the cited reference identically discloses the subject matter of the invention as claimed. In re Bond, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicant respectfully submits that the disclosure of Weber et al. fails to anticipate the invention as claimed in Claims 1-3 and 5-15 as amended herewith because Weber et al. do not disclose a thin base that possesses a natural decomposing ability. No where in the disclosure of Weber et al. is there a discussion of providing a thin mat that possesses a natural decomposing ability. To the contrary, Weber et al. merely teach a mat with sufficient thickness to retain moisture (see page 1, line 27).

The base cited by Weber et al. didn't disclose one having natural decomposing ability. Nowadays, in organic farming, the trend in agricultural production is to cultivate plants with the least or even without any chemical agents. Traditionally, because no herbicide was available, farmers needed to weed by hand. Such weeding today will cost a huge amount of man power and may delay farming for a long period of time. To overcome this step, weed-removal is performed by covering the land with a black plastic film for light-blocking to prevent the weeds from growing. However, because the black plastic film does not decompose naturally, a new problem of environmental pollution will occur once the plastic film is discarded. Accordingly, to deal with the problems of weeding and environmental pollution simultaneously, some new sowing method and materials are necessary. The present invention provides a base having natural decomposing ability which would solve the problems of weed-removal and environmental pollution at the same time and is distinct from the disclosure of Weber et al.

Moreover, Claim 1 has been amended to include a thin securing layer that is applied over the plant seeds in the thin base. Support for this amendment is found in the specification on page 2, lines 21-25, and page 3, lines 1-2. Weber et al. also disclose a securing layer, however, unlike Weber et al., the instant invention involves the use of a very thin securing layer made of either toilet paper or a paper-made towel. This securing layer is used not only for fixing the plant seeds but also for acting in a role of "soil-covering" which provides a weight to induce the geotropism of the radicles of the plant seeds. Then the radicles of the plant seeds pierce through the base and become rooted in the cultivating material. (See specification page 2, lines 21-25). To the contrary, Weber et al. merely disclose the use of a securing layer which is used to secure the seeds in the sheet (page 1, lines 74-78). The seeds then germinate in the cultivating material because there are holes in the mat which the seeds fall through to get to the cultivating material.

In view of these differences between the instant invention and the prior art, Applicant respectfully submits that the disclosure of Weber et al. fails to teach each and every element of the claimed invention, and the rejection of claims 1-3 and 5-15 under 35 U.S.C. §102(b) should be withdrawn.

The Examiner has rejected Claim 4 under 35 U.S.C. §103(a) as allegedly unpatentable over Weber et al. (U.S. Patent No. 526,512).

The burden of establishing a *prima facie* case of obviousness falls upon the Examiner. In determining whether a case of *prima facie* obviousness exists, it is necessary to ascertain whether or not the disclosure of the cited prior art would appear to be sufficient to one of ordinary skill in the art to make the claimed substitution, combination or other

modification. In re Lulu, 223 U.S.P.Z. 1257 (Fed. Cir. 1984). Under these standards, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness on the basis of Weber et al.

The Examiner asserts that it would have been obvious to one of ordinary skill in the art to provide a mat in the thickness range as cited in the instant claim 4 so as to allow sufficient thickness to receive seeds as cited by Weber et al. Applicant strenuously disagrees.

No where in the disclosure of Weber et al. is there any suggestion of a thickness within a certain range for use with the mat. In fact, Weber et al. merely discloses that for planting lawns, the mat **can** have a thickness of one eighth of an inch (page 1, line 69).

Unlike the disclosure of Weber et al., the instant specification discloses the use of a **thin** base with a thickness in the range of 0.2 mm to 0.3 mm. The emphasis is on the thin nature of the base. The thin nature facilitates the decomposition of the base so that no remnants are present after the base has been used for some time. Thus, the use of the thin base will cut down on environmental contamination (see specification page 1, lines 15-20).

Applicant respectfully submits that the disclosure of Weber et al. clearly teaches away from the novel aspects of the instant invention because Weber et al. merely disclose the use of mats that have a certain thickness that is able to retain water. Moreover, as stated on page 1, lines 17-19, Weber et al. argue that one difficulty is that thin mats dry very quickly. Based on these disclosures, Applicant submits that one of ordinary skill in the art would not find it obvious to use a thin base with a thickness range of 0.2 mm to 0.3 mm because Weber et al. teach away from the use of thin mats do to the concern that the mats would not retain water.

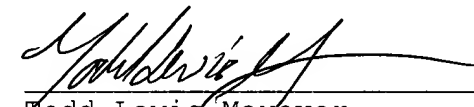
Accordingly, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness based on the disclosure of Weber et al., and therefore, the rejection of claim 4 under 35 U.S.C. §103(a) is clearly erroneous and must be withdrawn.

CONCLUSION

In view of the amendments and remarks presented herein, it is respectfully urged that the rejections set forth in the August 28, 2002 Official Action be withdrawn and that this application be passed to issue. In the event the Examiner is not persuaded as to the allowability of any claim, and it appears that any outstanding issues may be resolved through a telephone interview, the Examiner is requested to telephone the undersigned attorney at the phone number given below.

Respectfully Submitted,

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February 26, 2003

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Enclosures: Appendix A
 Substitute Specification
 Marked-up Substitute Specification

Appendix A

1. (Amended) A method of sowing [method of the] plant seeds, comprising the steps of:

a) providing a thin base with water-absorbing ability, [and] humidity-maintaining ability, and natural decomposing ability, wherein said thin base [includes] comprises a plurality of concavities;

b) inlaying said plant seeds in said [plural] plurality of concavities of said thin base and covering said plant seeds with a securing layer; and

c) covering a cultivating material with said thin base, wherein each concavity has a void [thereon] therein for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in said cultivating material while said corresponding plant seed is germinating.

2. (Amended) The method according to claim 1, wherein said thin base comprises light-blocking material for preventing the weeds from growing.

3. (Amended) The method according to claim [2] 1, wherein said thin base is selected from a group consisting of a mulching paper, a fabric, a fiber and a polymer with natural decomposing ability.

4. (Amended) The method according to claim 1, wherein said thin base [is] has a [thin layer having a] thickness [ranged] range from 0.2 mm to 0.3 mm.

5. (Amended) The method according to claim 1, wherein each of said plural concavities is arranged in said thin base with a specific interval of distance to adjacent one for

effectively increasing the uniformity of nutrition absorption and the usage of growth space of said plant seeds.

6. (Amended) The method according to claim 1, wherein [after said step b), said method further includes a step b1) of using] said securing layer is used to fix said plant seeds in said plural concavities of said thin base so as to induce said radicles of said plant seeds to be rooted in said cultivating material and increase the water-absorbing ability of said radicles of said plant seed.

7 (Amended) The method according to claim 6, wherein said securing layer is [one of] selected from a group consisting of a toilet paper and a paper-made towel.

8. (Amended) The method according to claim 6, wherein said securing layer is attached to said thin base [plate] for securing said plant seeds by using an adhesive material.

9. (Amended) The method according to claim 8, wherein said adhesive material is glue adapted to be uniformly [spray] sprayed [glue] on said thin base for attaching said securing layer to said thin base to fix said plant seeds.

10. (Amended) The method according to claim 1, wherein said plant seeds are selected from a group consisting of the seeds of a cereal, a vegetable, a flower, a [forest] tree and a fruit.

11. (Amended) A thin base with water-absorbing ability, [and] humidity-maintaining ability and natural decomposing ability for use in sowing [the] plant seeds to cover a cultivating material therewith [comprises] comprising a plurality of concavities for allowing said plant seeds to be

inlaid therein, wherein each concavity has a void [thereon] therein for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in said cultivating material while a plant seed is germinating.

12. (Amended) The thin base according to claim 11, wherein said thin base comprises light-blocking material for preventing weeds from growing.

13. (Amended) The thin base according to claim 11, wherein said thin base is selected from a group consisting of a mulching paper, a fabric, a fiber and a polymer with natural decomposing ability.

14. (Amended) The thin base [plate] according to claim 11, wherein said thin base [is] has a [thin layer having a] thickness range [ranged] from 0.2 mm to 0.3 mm.

15. (Amended) A mulching paper with natural decomposing ability for use in sowing [the] plant seeds to cover a cultivating material therewith comprising [comprises] a plurality of concavities for allowing said plant seeds to be inlaid therein, wherein each concavity has a void therein [thereon] for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in said cultivating material while said corresponding plant seed is germinating.



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SOWING METHOD OF THE PLANT SEEDS AND THE SOWING
MATERIALS USED THEREOF]

SEED SOWING METHOD AND MATERIALS

5 FIELD OF THE INVENTION

The present invention [is related] relates to a sowing method of [the]
plant seeds and the sowing materials used thereof, and [particularly]
more specifically to a sowing method of [the] plant seeds inlayed in a
weed-growth-preventing mulching paper and a weed-growth-preventing
10 mulching paper used thereof.

BACKGROUND OF THE INVENTION

[Generally] In General, [the] agricultural production comprises the
steps of land-preparation, sowing, fertilization, hand weeding and
15 harvest. Each step requires a huge amount of [men] man power.
[Particularly] In particular, [the step of] hand weeding [especially]
requires a huge amount of [men] man power [which always] that
ultimately results in delays [the organic farming for a period of time] in
the following harvest.

20 Conventional weed removal methods require covering the land with
a [To proceed the step of weed-removal, the farmers conventionally
cover the] black plastic film [for preventing the] to prevent weeds from
growing. However, after the crops are harvested, the [farmers don't
know how to deal with the useless] black plastic film remains on the
25 ground and contributes to environmental pollution. [Besides, because
the black plastic film can't be decomposed naturally, it thus tends to
result in environmental pollution once the black plastic film is discarded.

Therefore, nowadays, a new method of agricultural production for satisfying the requirement of weed-removal and preventing from resulting in the problems of environmental pollution attracts a large number of researchers' attention.] Accordingly, new methods of agricultural production are necessary for weed-removal and prevention
5 which does not result in environmental pollution.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a sowing method for
10 increasing the emergence percentage of [the] plant seeds.

Another object of the present invention is to provide a sowing method for increasing the production amount of [the] crops.

A further object of the present invention is to provide a method for simultaneously [proceeding] performing the steps of sowing, soil-
15 covering and weed-removal for agricultural production.

In a first aspect, the present invention is related to a sowing method of [the] plant seeds. The sowing method comprises the steps of: a) providing a base with water-absorbing ability and humidity-maintaining ability, wherein the base includes a plurality of concavities, b) inlaying
20 [the] plant seeds in the plural concavities of the base, and c) covering a cultivating material with the base, wherein each concavity has a void [thereon] therein for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in the cultivating material while the corresponding plant seed is germinating.

25 The base comprises light-blocking material for preventing [the] weeds from growing and is selected from a group consisting of a mulching paper, a fabric, a fiber and a polymer with natural

decomposing ability. Preferably, the base is a thin layer having a thickness [ranged] ranging from 0.2 mm to 0.3 mm.

Each of the plural concavities is arranged in the base with a specific distance interval [of distance to adjacent one] for effectively increasing
5 the uniformity of nutrition absorption and the [usage] use of growth space of the plant seeds.

[After the step b), the] The method further includes [a step b1) of] using a securing layer to fix the plant seeds in the plural concavities of the base so as to induce the radicles of the plant seeds to be rooted in the
10 cultivating material and increase water-absorbing ability of the radicles of the plant seed.

The securing layer is [one from] either a toilet paper [and] or a paper-made towel and is attached to the base [plate] for fixing the plant seeds by using an adhesive material.

15 The adhesive material is glue adapted to be uniformly [spray glue] sprayed on the base for attaching the securing layer to the base to fix the plant seeds.

The plant seeds are selected from a group consisting of the seeds of a cereal, a vegetable, a flower, a forest and a fruit.

20 In a second aspect, the present invention is related to a base with water-absorbing ability and humidity-maintaining ability for use in sowing [the] plant seeds to cover a cultivating material therewith comprises a plurality of concavities for allowing the plant seeds to be inlaid therein, wherein each concavity has a void [thereon] therein for
25 allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in the cultivating material while a plant seed is germinating.

The base comprises light-blocking material for preventing [the] weeds from growing and is selected from a group consisting of a mulching paper, a fabric, a fiber and a polymer with natural decomposing ability. Preferably, the base is a thin layer having a
 5 thickness [ranged] ranging from 0.2 mm to 0.3 mm.

In a third aspect, the present invention is related to a mulching paper for use in sowing [the] plant seeds to cover a cultivating material therewith comprising [comprises] a plurality of concavities for allowing the plant seeds to be inlaid therein, wherein each concavity has a void
 10 [thereon] therein for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in the cultivating material while the corresponding plant seed is germinating.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

15 The present invention is directed to a [sowing] method of sowing plant seeds and the sowing materials used thereof. The sowing method comprises the steps of a) providing a base with water-absorbing ability and humidity-maintaining ability, wherein the base includes a plurality of concavities, b) inlaying [the] plant seeds in the plural concavities of
 20 the base, and c) covering a cultivating material with the base, wherein each concavity has a void [thereon] therein for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in the cultivating material while the corresponding plant seed is germinating. The base comprises light-blocking material for preventing [the] weeds
 25 from growing and is selected from a group consisting of a mulching paper, a fabric, a fiber and a polymer with natural decomposing ability.

Preferably, the base is a thin layer having a thickness [ranged] ranging from 0.2 mm to 0.3 mm.

The present invention may best be understood by the following example which uses a mulching paper as a base.

5 [First of all, a] A number of sites of the mulching paper [is] are pressed [thereon] therein with a specific distance interval [of distance to adjacent one] for forming a plurality of concavities. Each concavity has a void [thereon] therein for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in the soil. Thereafter, [the]
10 plant seeds are inlaid in each of the plural concavities, respectively. Finally, glue is [used to be] uniformly sprayed on the mulching paper for attaching the securing layer, [the] toilet paper (made by YUEN FOONG YU PAPER MFG CO., LTD), to the mulching paper.

 The toilet paper used herein is for fixing the plant seeds, achieving
15 the objective of soil-covering and inducing the radicles of the plant seeds to be rooted in the soil for absorbing water. Because the mulching paper used herein can prevent the weeds from growing, [thus] the application of herbicides to control weeds is unnecessary, and [the] environmental pollution can be avoided. [Besides, because] Because of
20 the good water-absorbing ability and humidity-maintaining ability of the mulching paper, adequate irrigation and fertilization will expectably increase the germination percentage of the plant seeds as long as the mulching paper is well attached to the surface of the cultivating soil. In addition, the [plural] concavities arranged in the mulching paper [with a
25 specific distance interval to adjacent one] can [not only] spread the plants out uniformly [but] and also increase the uniformity of nutrition absorption and the [usage] use of growth space [of] by the plants.

Accordingly, the present invention provides a method for simultaneously proceeding the steps of sowing, soil-covering and weed control for agricultural production, [and thus the cost is lowered] which ultimately reduces cost.

5 [As we know, while] While the mulching paper is spread on the surface of soil in the field, an amount of soil is usually placed on the edge of the mulching paper [for preventing] to prevent the mulching paper from being blew [up or off] away by the wind. However, the edge of the mulching paper is easily [to be] torn up by the wind. [For
10 obviating] To obviate this problem, the edge of the mulching paper can be folded back to increase the strength of the edge of the mulching paper.

Experiment

[At first, the punching-plates are] Punching-plates were prepared in
15 advance. [Then, the] The punching-plates [are] were immobilized onto [the] mulching papers (58 x 16 cm) for punching concavities in the mulching papers [by the] using nails. For one mulching paper, the [interval of] distance interval for the punched concavities [is] was 2 cm, which resulted in [and] 244 concavities [are formed]. [Then inlaying
20 244] Two hundred forty-four water convolvulus seeds [and] or cabbage seeds were then inlaid in the concavities of the mulching papers [respectively]. [After the glue is] Glue was sprayed uniformly on the mulching papers, [the] toilet paper [and the] or paper-made towels [are] were [respectively] attached to the mulching papers [for securing] to
25 secure the plant seeds. Thereafter, they [are] were air-dried naturally, and the combination of the plant seeds with the mulching paper [is accomplished] was complete. Finally, [the] cultivation boxes (60 x 17 x

20 cm) including cultivating soil, were [are] covered with the mulching papers. [On the other hand, another] For comparison, a control group of [direct sowing, i.e. the prior art, is] directly sowed plant seeds were also prepared [for comparison]. After these groups [are] were cultivated in
5 the green-house for 21 days, the emergence percentage of the plant seeds, the fresh weight of the plants, the number of the plants and the weed-controlling capability were measured. The results are shown in Tables 1 and [Table] 2.

[From] Table 1[,] shows many [there are a lot of] differences [of]
10 between the emergence percentage of the plant seeds, the fresh weight of the plants, the number of [the] plants and the weed-controlling capability between the [present invention and the prior art] cultivation of water convolvulus and the control group. The weed amount [is] was 0.50 [according to the present invention] for the water convolvulus
15 compared to[, while which is] 32.75 [according to the prior art] for the control group. [Besides] In addition, the weed-controlling capability [is] was 98.47% [according to the present invention], which [is] was much [better] greater than that [according to the prior art] for the control group.

[From] Table 2[,] shows many [there are as well a lot of] differences
20 [of] in the emergence percentage of the plant seeds, the fresh weight of the plants, the number of [the] plants and the weed-controlling capability between the [present invention] cabbage and the [prior art] control group. For example, [The] the weed amount [is] was 1.67 [according to the present invention] for cabbage compared to[, while
25 which is] 46.33 [according to the prior art] for the control group. [Besides] Moreover, the weed-controlling capability [is] was 96.40%

[according to the present invention], which [is as well] was much [better] greater than that [according to the prior art] for the control group.

In conclusion, the emergence percentage of the plant seeds, the fresh weight of the plants, the number of [the] plants and the weed-controlling
 5 capability according to the present invention [are] were much [better] greater than those [according to the prior art] results for the control group of seeds directly sowed in the cultivating soil. Thus, [The] the present invention provides a [sowing] method for simultaneously [proceeding] performing the steps of sowing, soil-covering and weed-
 10 removal for agricultural production, which lowers [and thus the] cost [is lowered]. Moreover, besides [the] mulching paper, other kinds of materials, such as [the fabric] fabrics, [the fiber] fibers and [the polymer] polymers with natural decomposing ability, can also be used as the base with good water-absorbing ability and humidity-maintaining ability.

15

Table 1 The cultivation of the water convolvulus.

Cultivation results	Water convolvulus ¹			Weed amount (g)	Weed- controlling capability (%)
	Emergence percentage (%)	Fresh weight (g)	Number		
[Present invention] <u>Water convolvulus</u>	74.83a ³	287.50a	271.50a	0.50b	98.47
[Prior art] <u>Control Group</u>	9.95b	145.25b	79.75b	32.75a	0.00

1. The counted area is 0.10 square meter.
2. All the data shown are average numbers of four specimens.
3. According to Duncan's multiple range test, $p=0.05$.

5 Table 2 The cultivation of the cabbage.

Cultivation results	Cabbage ¹			Weed amount (g)	Weed- controlling capability (%)
	Emergence percentage (%)	Fresh weight (g)	Number		
[Present invention] <u>Cabbage</u>	90.0a ³	430.00a	201.67a	1.67b	96.40
[Prior art] <u>Control</u> <u>Group</u>	75.44b	211.67b	126.00b	46.33a	0.00

1. The counted area is 0.0928 square meter.
2. All the data shown are average numbers of four specimens.
3. According to Duncan's multiple range test, $p=0.05$.

10

While the invention has been described in terms of what are presently considered to be the most practical and preferred embodiments, it is to be understood that the invention need not be limited to the disclosed embodiment. On the contrary, it is intended to cover various
15 modifications and similar arrangements included within the spirit and scope of the appended claims which are to be accorded with the broadest interpretation so as to encompass all such modifications and similar

structures. Therefore, the above description and illustration should not be taken as limiting the scope of the present invention which is defined by the appended claims.

[A SOWING METHOD OF THE PLANT SEEDS AND THE SOWING
MATERIALS USED THEREOF]

ABSTRACT OF THE DISCLOSURE

5 A [sowing] method of sowing plant seeds and the sowing materials
used thereof [is] are disclosed. The sowing method comprises the steps
of a) providing a base with water-absorbing ability and humidity-
maintaining ability, wherein the base includes a plurality of concavities,
b) inlaying the plant seeds in the plural concavities of the base, and c)
10 covering a cultivating material with the base, wherein each concavity
has a void [thereon] therein for allowing a radicle of a corresponding
plant seed to pierce therethrough and be rooted in the cultivating
material while the corresponding plant seed is germinating. The base
comprises light-blocking material for preventing [the] weeds from
15 growing and is selected from a group consisting of a mulching paper, a
fabric, a fiber and a polymer with natural decomposing ability.
Therefore, the steps of sowing, soil-covering and weed-removal for
agricultural production can be proceeded simultaneously and thus [the]
lower cost [is lowered].